UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,609	12/03/2003	Frank Edughom Ekpar		2486

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EXAMINER
WANG, KENT F

ART UNIT	PAPER NUMBER
2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<table>
<tr><td rowspan="2">Office Action Summary</td><td>Application No.
10/728,609</td><td>Applicant(s)
EKPAR, FRANK EDUGHOM</td></tr>
<tr><td>Examiner
KENT WANG</td><td>Art Unit
2622</td></tr>
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/20/2009*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2, 5-25, 28-40, and 42-45* is/are rejected.

7)☒ Claim(s) *3,4,26,27,41 and 46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 May 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendments, filed on 02/20/2009, have been entered and made of record. Claims 1-46 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-46 have been fully considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-2, 7-8, 10, 18-19, 22, 24-25, 30-31, 33, 42, and 45 are rejected under 35 U.S.C. § 102(b) as being anticipated by Lelong, US 5,444,478.

    Regarding claim 1, Lelong discloses an apparatus (the image pickup system) for creating, managing and publishing interactive virtual tours (6:30-39), the apparatus comprising:

    -   a panorama data acquisition unit (three fixed cameras C1, C2, C3, Fig 2) implementing means of capturing panoramic data representing a plurality of environment maps and preparing said panoramic data for further processing (6:30-39);

- a transform engine (an image reconstruction system 100, Fig 2) responsive to said

panoramic data and implementing means of correcting distortions in said

panoramic data and/or performing automatic, manual or interactive calibration of

said panoramic data and/or transforming said panoramic data into a desired

format or set of formats when necessary (10:28-48), wherein said distortion

correction is accomplished through steps of: a) loading data including reference

data that could be used to derive panoramic imaging system distortion profiles; b)

specifying a linear or other predetermined distortion function or set of distortion

functions and displaying representations of said distortion function or set of

distortion functions; c) using distortion function or set of distortion functions to

build a distortion profile for the panoramic imaging system that was used to

acquire the reference data; d) performing transformation on panoramic data using

distortion profile specified in c) and displaying results of said transformation; e)

determining whether distortion is satisfactorily corrected; f) continuing with steps

g) and h) if distortion is deemed not to have been satisfactorily corrected and

continuing with step i) if distortion is deemed to have been satisfactorily

corrected; g) automatically or interactively modifying the distortion function or

set of distortion functions using feedback from displayed distortion function

representation or transformation results obtained in step d) or by using data loaded

in step a); h) repeating steps c) to g) until distortion is judged to have been

satisfactorily corrected; i) storing distortion profile obtained in step c) for use in

performing transformations on panoramic data acquired using the panoramic

imaging system for which data was loaded in step a) (3:19-42, please see section III, IV and V for image reconstruction processing steps in 9:26-12:12, and claims 1-2);

- a package generator (an address computer 200, Fig 3) adapted to generate virtual tour packages containing said panoramic data, commands and/or optional virtual tour data (12:13-14:12);

- a viewing engine (an address computer 200, Fig 3) responsive to said panoramic data and/or virtual tour packages and implementing means for perspective correction, and user interaction with, said panoramic data and/or virtual tour data when necessary (12:13-14:12);

- a control engine (a control system 1, Fig 2) adapted to facilitate a higher level of interaction with said panoramic data and/or virtual tour data, wherein said control engine is connected operatively to and communicates bi-directionally with said viewing engine, renders representative information about all or parts of said virtual tour, permits a particular portion to be selected from said virtual tour and sends signals to said viewing engine that cause said viewing engine to permit the interactive navigation of said selected portion of said virtual tour, wherein said control engine also indicates or causes to be indicated what portion of said virtual tour is currently selected and what sub-part of said selected portion of said virtual tour is currently rendered, wherein said control engine is responsive to user input and/or commands from said viewing engine and is in turn capable of modifying said representative information about all or parts of said virtual tour in response to

said user input and/or said commands from said viewing engine and is further

capable of communicating information indicative of such externally induced

modifications to said user and/or said viewing engine (4:41-62, 10:17-54, 11:5-

19);

- a display means (display means 10, Fig 2) for rendering output of said viewing

engine, control engine, package generator, transform engine, and/or panoramic

data acquisition unit (10:41-54).

Regarding claim 2, Lelong teaches a panoramic data acquisition unit (three fixed cameras

C1, C2, C3, Fig 2) is adapted to capture data representing panoramic images or video (6:30-

39).

Regarding claim 7, Lelong teaches a panoramic data acquisition unit (three fixed cameras

C1, C2, C3, Fig 2) is adapted to capture each complete panoramic data block in a single

image/video frame (6:30-39).

Regarding claim 8, Lelong teaches a panoramic data acquisition unit (three fixed cameras

C1, C2, C3, Fig 2) is adapted to capture each complete panoramic data block in a plurality of

image/video frames that are combined to form complete panoramic data blocks (6:30-39).

Regarding claim 10, Lelong teaches a panoramic data acquisition unit (three fixed

cameras C1, C2, C3, Fig 2) further comprises of preparing and transferring all or portions of

acquired panoramic data to transform engine, viewing engine, or display said control engine

or said display; wherein said preparation and/or transfer involves compression and/or

decompression of all or portions of acquired panoramic data; wherein said preparation and/or

transfer is in response to user commands or information inferred from the state of said

viewing engine or said control engine (6:30-39).

Regarding claim 18, Lelong teaches an image transformation engine (an image

reconstruction system 100, Fig 2) being responsive to user input and implements for

perspective correction of panoramic data (6:30-39).

Regarding claim 19, Lelong discloses the viewing engine (an address computer 200, Fig

3) further implements of navigating panoramic data (12:13-14:12).

Regarding claim 22, Lelong teaches the representative information rendered by control

engine (a control system 1, Fig 2) about all or parts of virtual tour is rendered in 2D, 3D or

higher dimensional space and/or time (10:28-44).

Regarding claims 24-25, 30-31, 33, 42, and 45, these nine claims are method claims

corresponding to apparatus claims 1-2, 7-8, 10, 19, and 22. Therefore, method claims 24-25,

30-31, 33, 42, and 45 are analyzed and rejected as previously discussed with respect to

apparatus claims 1-2, 7-8, 10, 19, and 22.

Claim Rejections - 35 USC § 103

5.   The text of those sections of Title 35, U.S. Code not included in this action can be found in a

prior Office action.

6.   Claims 5 and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lelong,

US 5,444,478, in view of Tanida, US 7,009,652.

Regarding claims 5 and 28, note the discussion of Lelong above. Lelong does not

mention comprises at least one grid of one or more photosensitive elements on a surface

with a spherical geometry. In same field of endeavor (video camera), Tanida teaches a well-

known video camera which has a multiplicity of photosensitive pixel elements array on a

spherical surface (2: 22-24). It would have been obvious to one of the ordinary skill in the

art at the time the invention was made to have provided a multiplicity of photosensitive

elements placed on spherical surface as taught by Tanida to the camera or acquisition unit of

Lelong because the arrangement of photosensitive elements on spherical surface of Tanida

would obtain a high resolution image (2:11-24, Tanida).

7.   Claim 6 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lelong, US

5,444,478, in view of Keast, US 5,721,585.

Regarding claims 6 and 29, note the discussion of Lelong above. Lelong discloses the

field of view of all of the cameras collectively captured is a complete 360-degree panoramic

field of view. Lelong, however, does not specifically disclose a vertical field of view that is

usually less than 180 degrees. Keast teaches an image system provides both a 180-degree

vertical view and a 360-degree azimuthal view (5:16-28, and 6:54-67). It would have been

obvious to one of ordinary skill in the art at the time invention was made to have added the

180-degree vertical view as taught by Keast to the panoramic field of view of Lelong

because both 180-degree vertical field of view and 360-degree panoramic field of view

would provide a complete and uniform imaging of the sphere of view (5:16-29, Keast).

8.   Claims 9, 14-16, 20-21, 23, 32, 37-39, 43-44, and 46 are rejected under 35 U.S.C. § 103(a)

as being unpatentable over Lelong, US 5,444,478, in view of Jackson et al., US 5,990,941.

Regarding claim 9, note the discussion of Lelong above. Lelong discloses an imaging

system for the production of virtual tour data includes in either a still image or a video format

(2:9-11). Lelong, however, does not specifically disclose to resources on local and distributed

networks. Jackson teaches the ability to delivery these image data, still or full motion video

via broadcast, cable, digital network such as Internet, or on transportable media such as CD-

ROM, videotape, or laserdisc from a remote site 12 to a local site 14. It would have been

obvious to one of ordinary skill in the art at the time invention was made to have added

ability to delivery these image data as taught by Jackson to the imaging system of view of

Lelong because this feature provides the spherical image can be transmitted to multiple users

at local locations (10:12-27, Jackson).

Regarding claim 14, Jackson teaches a package generator implement specifying active

regions on panoramic data. Jackson teaches a so-called "hot spots", as disclosed in column 4,

lines 3 - 7, that are identified by a user as the user interacts with the stored data files

representing the images.

Regarding claim 15, Jackson teaches to specify the navigable paths for interactive display

of any portion of a spherical image, as disclosed in column 4, lines 8 - 10.

Regarding claim 16, Jackson teaches that the end user could utilize the navigable paths or

walk-through sequences are navigated in automatic or guided mode (i.e. controls the

direction of viewing by moving a computer mouse; see Figure 9 and also 8:16-31).

Regarding claims 20 and 21, Jackson teaches a viewing engine implements means for a

single user or a plurality of users to independently and simultaneously interact with and

navigate panoramic data (8:16-31 and 10:12-27).

Regarding claim 23, Jackson teaches the view engine and control engine comprising a

unitary structure (microcomputer and control interface 15 as shown in Figure 1).

Claims 32, 37-39, and 43-44 are method claims. Thus, they are analyzed as previously

discussed with respect to the apparatus claims 9, 14-16, and 20-21 above.

9.   Claims 11-13 and 34-36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over

Lelong, US 5,444,478, in view of Xiong, US 5,960,108.

Regarding claim 11, note the discussion of Lelong above. Lelong teaches the transform

engine of claim 1, but doesn't teach conversion from one format. Xiong teaches the

capability to convert the panoramic data from a first format to one or more formats and/or

vice versa (i.e. conversion of 3D rays to 2D image, see Figure 2 and also 4:34-45). It would

have been obvious to one of the ordinary skill in the art at the time the invention was made to

have included the panoramic data conversion as taught by Xiong to the transform engine of

Lelong because it allows an arbitrarily large field of view (4:54- 56, Xiong).

Regarding claim 12, Xiong teaches that the panoramic data conversion is between

different coordinates (an ordinary rectilinear lens is projection from a 3D ray to a 2D image

position; 3:12-24, 4:34-67, and 6:1 to 7:26).

Regarding claim 13, Xiong provides a plurality of images, each of the plurality of images

including a plurality of parameters and optimizing the plurality of parameters for each of the

plurality of images in accordance with a set of distortion functions that is based on a set of

polynomials of suitable degree (i.e. $r = c_1\theta + c_2\theta 2 + c_3\theta^3 +$, where the order of polynomial

can be determined experimentally, see 4: 34-67).

Regarding claims 34-36, these claims are method claims and analyzed as previously

discussed with respect to the apparatus claims 11-13 above.

10. Claims 17 and 40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lelong,

US 5,444,478, in view of Smith, US 6,226,658.

Regarding claims 17 and 40, Smith teaches a layout code tuning in universally readable

document files. More specifically, as disclosed in column 2, lines 28 - 46, Smith discloses a

system and method in which page layout code in so-called "universal" document file formats

is customized to make the file format more universally compatible across a spectrum of

different manufacturers. It would have been obvious to one of the ordinary skill in the art at

the time the invention was made to have included the universally readable document files as

taught by Smith to the imaging system of Lelong because this feature makes it possible for

arbitrary types and numbers of elements to be managed by universal file format.

Allowable Subject Matter

11. Claims 3-4, 26-27, 41 and 46 are previously objected to as being dependent upon a rejected

base claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

- Ritchey (US 5,130,794) discloses A panoramic image based virtual reality display

system includes a panoramic optical assembly, preferably of substantially spherical

coverage, feeding composite optical images to a light sensitive surface of a video

camera for storage or further processing in image processing circuitry;

- Dorbie (US 6,545,685) discloses A method for implementing edge blending between

  a first and second video frame to create a seamless multichannel display system;

- Henley (US 5,657,073) discloses a seamless multi-camera panoramic imaging with

  distortion correction and selectable field of view; and

- Zimmermann (US 5,185,667) discloses a device for omnidirectional image viewing

  providing pan-and-tilt orientation, rotation, and magnification within a hemispherical

  field-of-view which produces a circular image of an entire hemispherical field-of-

  view, which can be mathematically corrected using high speed electronic circuitry.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office

action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until

after the end of the THREE-MONTH shortened statutory period, then the shortened statutory

period will expire on the date the advisory action is mailed, and any extension fee pursuant to

37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Kent Wang whose telephone number is 571-270-1703. The examiner

can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the

organization where this application or proceeding is assigned is 571-270-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status information

for unpublished applications is available through Private PAIR only. For more information

about the PAIR system, see http://portal.uspto.gov/external/portal/pair. Should you have

questions on access to the Private PAIR system, contact the Electronic Business Center

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Service Representative or access to the automated information system, call 800-786-9199 (IN

USA OR CANADA) or 571-272-1000.

/Sinh N Tran/
Supervisory Patent Examiner, Art Unit 2622
KW
26 February 2009